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DEPTH MEASURING INSTRUMENT

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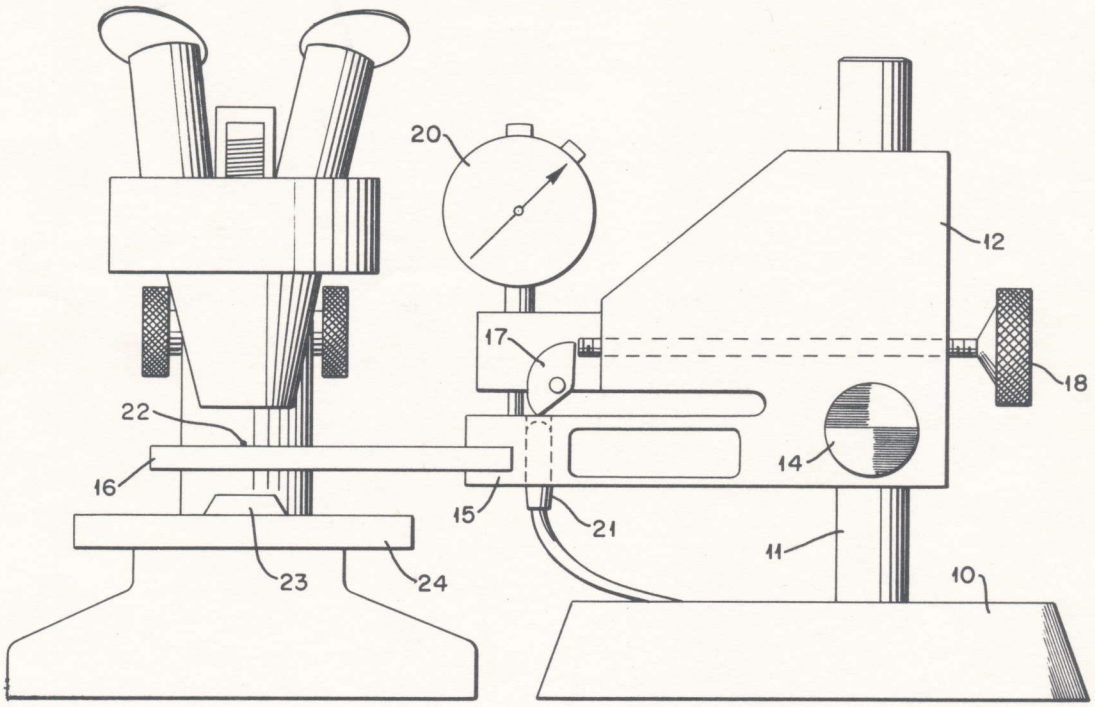

This instrument measures the height of minute surface particles, surface irregularities and shallow cavities without physical contact. It is necessary to determine the coincidence of position of two points in space and that two such points are in a plane perpendicular to a line of sight.

The instrument comprises a three-dimensional microscope with a measuring attachment. The attachment consists of a base 10 bearing a post 11 for mounting a carrier 12. This is held in vertical adjustment by a screw 14. An arm 15 formed on the carrier supports a mirror type beam splitter 16 and is flexed by a cam 17 and adjusting screw 18. Mounted on the carrier and in contact with the arm is a gauge 20. The mirror is edge-lighted by a lamp 21 and has a point or dot 22 etched on it to act as a pointer.

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DEPTH MEASURING INSTRUMENT - Continued

The device operates on the principle that light rays reflected from a mirror appear to come from a point (image) behind the surface or a position in space a distance equal to that held by the object in front of the mirror. The point or dot 22 etched on the non-reflecting side of the mirror therefore appears to be located in space beyond the mirror a distance equal to the thickness of the glass.

Surface irregularities of an object 23 placed on the platform 24 of the microscope are measured as follows:

1. The microscope is adjusted to suit the observer.

2. The mirror is adjusted by flexing arm 15 by screw 18 until the pointer 22 appears to be located in space below the mirror and superimposed on a predetermined reference level. The reading on the depth gauge is noted.

3. The mirror is readjusted by screw 18 until pointer 22 appears to be superimposed on the point to be measured. The difference between this reading on the gauge and the first one is the height or depth of the point measured.

The instrument may be modified by using a prism type beam splitter in which the pointer may either be a scale or line which can be rotated in all planes such that the angle of or a length on a slope can be measured. A device of this type can also be used for comparing contours or profiles against a master.